

EXHIBIT 127

**PLAINTIFFS' OPPOSITION TO DEFENDANTS'
MOTION FOR PARTIAL SUMMARY JUDGMENT ON THE FIRST
ELEMENT OF THE GOVERNMENT CONTRACTOR IMMUNITY DEFENSE**

EXHIBIT LIST

EXHIBIT	DESCRIPTION
1	Declaration of Plaintiffs' Expert Patrick Lowder, Ph.D, J.D. and attachments
2	Deposition Transcript of Robert Darwin (Vol. I), dated Apr. 28, 2021
3	United States of America's Responses to Plaintiffs' First Set of Amended Requests for Admission ("US Resp. to Pls.' RFAs")
4	Deposition Transcript of Anne Regina (Vol. II), dated Dec. 2, 2020
5	Declaration of Janet K. Anderson, Ph.D. and Exhibit A (Expert Opinion of Janet K. Anderson, Ph.D., D.A.B.T., dated Nov. 22, 2019) attached thereto
6	Declaration of Plaintiffs' Expert Linda S. Birnbaum, Ph.D., D.A.B.T., A.T.S. and attachments
7	Deposition Transcript of John Butenhoff, Ph.D. (Vol. II), dated July 24, 2020
8	Carpenter, Murray, " <i>‘Forever chemicals,’ other pollutants found around the summit of Everest,</i> " The Washington Post, April 17, 2021.
9	Exhibit DL156 to the Deposition of Frederick Walker, Aug. 3, 2000 presentation "Phasing Out a Problem: Perfluorooctyl Sulfonate (PFOS)" by Mary F. Dominiak (EPA), (3M_BELL01511644)
10	EPA memorandum, dated Aug. 31, 2000, re: Domestic Manufacturers or Importers of PFOS Chemicals Other Than 3M (3M_AFFF_MDL02318474)
11	EPA Press Release, dated May 16, 2000 (3M_BELL00848209)
12	Exhibit DL104 to the Deposition of John Butenhoff, Email from Charles Auer, dated May 16, 2000, re: Phaseout of PFOS (DOD04-00015690)
13	Exhibit DL1423 to the 30(b)(6) Deposition of John Gerber, EPA Risk Management for Per- and Polyfluoroalkyl Substances (PFAS) under TSCA
14	Investigation of Perfluorochemical (PFC) Contamination in Minnesota Phase One, Report to Senate Environment Committee, dated Feb. 2006 (3M_AFFF_MDL00354270)
15	Federal Register 68:73 (Apr. 16, 2003) p. 18626 (PENNA-NAVY-018123)
16	Exhibit DL187 to the Deposition of Michael Santoro, Presentation to EHS Minichapter, Mar. 11, 2004, M.A. Santoro (3M_AFFF_MDL01092213)
17	Exhibit 7 to the 30(b)(6) Deposition of Brian Mader (demonstrative)
18	Exhibit 8 to the 30(b)(6) Deposition of Brian Mader (demonstrative)
19	Exhibit LP2 to the Deposition of Geary Olsen, Olsen, G.W., et al. <i>Decline in Perfluorooctanesulfonate and Other Polyfluoroalkyl Chemicals in American Red Cross Adult Blood Donors, 2000-2006</i> . Environ. Sci. Technol. 2008, 42, 4989-4995.
20	Exhibit LP68 to the 30(b)(6) Deposition of John Gerber, Chronology (3M_BELL00054594)
21	Deposition Transcript of John Butenhoff, Ph.D. (Vol. I), dated July 23, 2020
22	U.S. Patent No. 2,519,983 (issued Aug. 22, 1950)
23	Declaration of Plaintiffs' Expert Gregory M. Walton, P.E. and attachments

EXHIBIT	DESCRIPTION
24	Deposition Transcript of Michael Falco, dated Nov. 18, 2020
25	U.S. Patent 2,567,011 (issued Sept. 4, 1951) (3M_AFFF_MDL02153586)
26	Exhibit DL434 to the Deposition of Michael Falco, U.S. Patent 2,732,398 (issued Jan. 24, 1956)
27	Exhibit DL437 to the Deposition of Michael Falco, U.S. Patent 2,759,019 (issued Aug. 14, 1956)
28	Exhibit DL438 to the Deposition of Michael Falco, U.S. Patent 2,764,602 (issued Sept. 25, 1956)
29	U.S. Patent 2,809,990 (issued Oct. 15, 1957)
30	U.S. Patent 3,245,817 (issued Apr. 12, 1966)
31	Exhibit DL390 to the Deposition of Michael Falco, <i>Popular Mechanics</i> , Mar. 1952 (3M_AFFF_MDL00579820)
32	Exhibit DL124 to the Deposition of Michael Falco, "History of the Development of 'Light Water' Brand Aqueous Film Forming Foam Concentrates" (3M_AFFF_MDL01297999)
33	Exhibit DL388 to the Deposition of Robert Darwin, 1961 3M Co. advertisement (US-Darwin-00006295)
34	Exhibit DL389 to the Deposition of Robert Darwin, 3M Co. advertisement (US-Darwin-00010031)
35	Deposition Transcript of John Farley (Vol. I), dated June 24, 2021
36	Exhibit DL13 to the Deposition of John Butenhoff, report for Commercial Chemicals Product Lines (3M_AFFF_MDL00080683)
37	Exhibit DL387 to the Deposition of Michael Falco, 3M Co. Light Water advertisement (US-Darwin-00010027)
38	Exhibit DL1385 to the Deposition of John Farley, Declaration of John P. Farley, dated Apr. 30, 2021
39	Exhibit DL1385-4 to the Deposition of John Farley, Exhibit 4 to the Declaration of John P. Farley (PENNA-NAVY-010905)
40	Exhibit DL1336 to the Deposition of Robert Darwin, Navy memoranda on AFFF (excerpt of Navy05-00001795 at Navy05-00001825-31; a full copy can be provided upon request)
41	Exhibit BB556 to the 30(b)(6) Deposition of Eduard Kleiner, Ph.D., MIL-F-24385 QPL/QPD History for Type 6 and Type 3 AFFF
42	Exhibit DL436 to the Deposition of Robert Darwin, MIL-F-24385, dated Nov. 21, 1969 (NAVY01-000000904)
43	MIL-PRF-24385F(SH), dated Sept. 7, 2017 (DOD01-000005595)
44	MIL-PRF-24385F(SH), dated May 7, 2019 (NAVY01-000021563)
45	3M Advertisement for Light Water AFFF FC-200 (3M_AFFF_MDL00015412)
46	Deposition Transcript of John Prins, Ph.D., D.A.B.T., dated Jan. 21, 2021
47	Exhibit DL49 to the Deposition of Charles Reich, "3M Phasing Out Some of its Specialty Materials," dated May 16, 2000 (3M_AFFF_MDL00207575)
48	Hughes Associates, Inc., "Estimated Quantities of Aqueous Film Forming Foam (AFFF) in the United States" (3M_AFFF_MDL01397437)

EXHIBIT	DESCRIPTION
49	Exhibit BB226 to the Deposition of Larry Zobel, M.D., Index of 3M Toxicology and Human Health Studies Submitted to the U.S. Environmental Protection Agency as of September 8, 2000 (3M_BELL01639192)
50	Exhibit DL353 to the 30(b)(6) Deposition of John Gerber, Letter from 3M Co. to EPA, dated May 15, 1998, re: TSCA Section 8(e) (3M_BELL02796621)
51	Letter from Charles M. Auer (EPA) to Dr. Scott A. Masten (NIEHS), dated Aug. 7, 2003 (3M_AFFF_MDL01669634)
52	Exhibit LP193 to the Deposition of Geary Olsen, Mayer & Brown, “3M to Discontinue Some Scotchgard Repellant Products,” May 17, 2000.
53	Exhibit DL11 to the 30(b)(6) Deposition of John Gerber, 3M Co. internal memorandum, dated Aug. 20, 1975 (3M_AFFF_MDL00419718)
54	Exhibit LP207 to the 30(b)(6) Deposition of John Gerber, 3M Co. internal memorandum, dated Aug. 22, 1975 (3M_MN05382159)
55	Exhibit BB424 to the 30(b)(6) Deposition of John Gerber, 3M Co. internal memorandum, dated Sept. 22, 1975 (3M_BELL00054741)
56	Exhibit DL8 to the 30(b)(6) Deposition of John Gerber, Chronology – Fluorochemicals in Blood (3M_BELL00054589)
57	Exhibit DL9 to the 30(b)(6) Deposition of John Gerber, Central Analytical Laboratory Report No. 6448, dated Nov. 6, 1975 (3MA00967400)
58	30(b)(6) Deposition Transcript of John Gerber, dated Aug. 19, 2021
59	Exhibit DL884 to the Deposition of Geary Olsen, Belisle, J. <i>Organic Fluorine in Human Serum: Natural Versus Industrial Sources</i> . Science. 212 (1981).
60	Exhibit 16 to the 30(b)(6) Deposition of Brian Mader (demonstrative)
61	Exhibit 18 to the 30(b)(6) Deposition of Brian Mader (demonstrative)
62	Exhibit 19 to the 30(b)(6) Deposition of Brian Mader (demonstrative)
63	Exhibit 20 to the 30(b)(6) Deposition of Brian Mader (demonstrative)
64	Buck, R.C., et al. <i>Perfluoroalkyl and Polyfluoroalkyl Substances in the Environment: Terminology, Classification, and Origins</i> . Integr. Environ. Assess. Manag. 2011; 7:513-541
65	Current AFFF Market Channel (3M_BELL02641301)
66	Exhibit DL91 to the Deposition of Stephen Korzeniowski, Korzeniowski, S.H., et al. <i>Fluorosurfactants in Firefighting Foams: Past and Present</i>
67	Exhibit DL371 to the Deposition of Robert Buck, EPA 2010/2015 PFOA Stewardship Program Guidance on Reporting Emissions and Product Content, Oct. 2006
68	Exhibit DL93 to the Deposition of Stephen Korzeniowski, FFFC Fact Sheet on AFFF Fire Fighting Agents (2017) (Navy02-00002442)
69	Exhibit DL517 to the Deposition of Anne Regina, 2001 FFFC presentation titled “AFFF Fire Fighting Foams” (AFFF-MDL-CHE00000)
70	Deposition Transcript of Frederick K. Walker, Jr., dated May 19, 2021 (Vol. I)
71	Buck, R.C., et al. <i>Identification and classification of commercially relevant per- and poly-fluoroalkyl substances (PFAS)</i> . Integr. Environ. Assess. Manag. 2021; 17:1045–1055
72	An Appraisal of Fluorocarbons (1952) (3M_AFFF_MDL01863928)

EXHIBIT	DESCRIPTION
73	Deposition Transcript of Gregg Ublacker, dated Mar. 4, 2021 (Vol. II)
74	Exhibit DCC627 to the Deposition of Ronald Sheinson, Declaration of Ronald Sheinson, dated June 10, 2021
75	Deposition Transcript of Todd Thomas, Ph.D., dated Sept. 16, 2020
76	Exhibit LP245 to the Deposition of Todd Thomas, LODYNE K81'86 Hazard Evaluations (BASF_AFFF_MDL00005382)
77	30(b)(6) Deposition Transcript of Ashok Moza, dated Nov. 2, 2021
78	Deposition Transcript of William J. Fiedler, III, dated Oct. 19, 2021
79	Deposition Transcript of Philip J. Novac, dated Mar. 18, 2021
80	OECD (2018). "Toward a new comprehensive global database of per-polyfluoroalkyl substances (PFASs): Summary report on updated the OECD 2007 list of per and poly fluoroalkyl substances (PFASs)." Series on Risk Management No. 39, OECD.
81	Exhibit DL1385-6 to the Deposition of John Farley, Exhibit 6 to the Declaration of John P. Farley (PENNA-NAVY-020809)
82	Exhibit DL38 to the Deposition of John Butenhoff, 3M Co. MSDS for FC-206CF Light Water Brand AFFF, dated Feb. 19, 1997 (PENNA-NAVY-020452)
83	Exhibit DL39 to the Deposition of Michael Santoro, 3M Co. MSDS for FC-2303 Light Water Brand AFFF, dated May 1972 (3M_BELL00474500)
84	Exhibit DL1159 to the Deposition of Philip Novac, Ansul MSDS for Ansulite 6% AFFF (AFC-3), dated Nov. 15, 1985 (AFFFTC00045290)
85	Exhibit DL1160 to the Deposition of Philip Novac, Ansul MSDS for Ansulite 6% AFFF (AFC-3), dated June 1, 1989 (AFFFTC00045296)
86	Exhibit DL1162 to the Deposition of Philip Novac, Ansul MSDS for Ansulite 6% AFFF (AFC-5), dated June 1, 1989 (AFFFTC00045312)
87	Exhibit DL1163 to the Deposition of Philip Novac, Ansul MSDS for Ansulite 3% AFFF (AFC-5-A), dated Nov. 15, 1985 (AFFFTC00045322)
88	Exhibit DL1164 to the Deposition of Philip Novac, Ansul MSDS for Ansulite 3% AFFF (AFC-5-A), dated June 1, 1989 (AFFFTC00045328)
89	Exhibit DL1099 to the Deposition of Gregg Ublacker, Chemguard MSDS for 6% AFFF C-601MS, dated Jan. 26, 2006
90	Exhibit DL1103 to the Deposition of Gregg Ublacker, Ansul MSDS for Ansulite 6% AFFF (AFC-3), dated Nov. 15, 1985 (AFFFTC00045290)
91	Exhibit DL1748 to the Deposition of William Vegso, Buckeye MSDS for 3% MIL SPEC AFFF, 2008 (BF_00002499)
92	Buckeye MSDS for 3% MIL SPEC AFFF (BFC-3MS), 2012 (BF_00010323)
93	Buckeye MSDS for 3% MIL SPEC AFFF (BFC-3MS), 2004 (BF_00000606)
94	National Foam MSDS for Aer-O-Water 3EM AFFF, 2000 (NF0000000005)
95	National Foam MSDS for Aer-O-Water 6EM AFFF, 2000 (NF0000000013)
96	Department of the Air Force memorandum re: Replacement and Disposal of Legacy AFFF, dated Aug. 22, 2016 (AF02-000001138)
97	Department of the Navy memorandum re: AFFF Control, Removal, and Disposal, dated June 17, 2016 (PENNA-NAVY-017115)

EXHIBIT	DESCRIPTION
98	Exhibit DL53 to the Deposition of Robert Darwin, AFFF Conversion Program folder (excerpt of Navy02-00007150 at Navy02-00007167; a full copy can be provided upon request)*
99	NRL Memorandum Report 2733, A Substitute Liquid for AFFF Concentrate for Checking Proportioners, dated Feb. 1974 (Navy02-00007013)
100	3M Co. 1976 Light Water brochure (3M_BELL03194246)
101	3M Co. 1978 Light Water brochure (3M_BELL02617421)
102	Exhibit BB816 to the Deposition of Frederick Walker, 3M Co. letter to USAF Hospital/SGPB, dated Mar. 15, 1983, re: FC-780B AFFF (3M_BELL01440788)
103	3M Co. letter to EPA, dated Aug. 16, 1983, re: 3M AFFF Aquatic Toxicity (3M_BELL01440784)
104	3M Co. Product Toxicity Summary Sheet for FC-203CF Light Water Brand AFFF, dated Mar. 29, 1993 (US-Darwin-00005906)
105	Exhibit DL65 to the Deposition of Michael Santoro, 3M internal correspondence, dated Apr. 13, 1994, re: Contamination of water tank with FC-203CE (3M_AFFF_MDL00384561)
106	Deposition Transcript of Curtis Bowling, dated Oct. 7, 2021
107	Exhibit DCC705 to the Deposition of Curtis Bowling, EPA memorandum re: PowerPoint Presentation: EPA Activities/Issues on Fluorosurfactants (EPA01-00161541)
108	Exhibit DL480 to the Deposition of Anne Regina, Kidde Fire Fighting customer letter, dated Feb. 8, 2011 (NF000063181)
109	Deposition Transcript of Anne Regina, dated Dec. 1, 2020 (Vol. I)
110	Exhibit DL1126 to the Deposition of Philip Novac, Chemguard Specialty Chemical and Fire Suppression Products: An Environmental Statement, dated Feb. 9, 2009 (AFFFTC00196371)
111	Exhibit DL1134 to the Deposition of Philip Novac, Chemguard Fluorosurfactants Environmental Position, dated Aug. 1, 2007 (AFFFTC00418728)
112	Exhibit DL1753 to the Deposition of William Vegso, Email chain, dated June 14, 2019, re: Buckeye Foam and HB-1279 (BF_00390042)
113	Deposition Transcript of Jim Devonshire, dated Oct. 27, 2021
114	Deposition Transcript of Ronald Sheinson, Ph.D., dated June 28, 2021
115	Exhibit DL464 to the Deposition of Anne Regina, Email chain, dated Sept. 15, 2008, re: DoD Memo on PFOA (NF000165533)
116	Exhibit DL1125 to the Deposition of Philip Novac, Frequently Asked Questions: PFOS, PFOA and Firefighting Foams, dated Feb. 2017 (AFFFTC00728486)
117	Exhibit DL1135 to the Deposition of Philip Novac, Introduction to Chemguard and Chemguard Fluorosurfactants (AFFFTC00043581)
118	30(b)(6) Deposition Transcript of Eduard Kleiner, Ph.D., dated Nov. 10, 2020 (Vol. II)
119	Air Force Civil Engineer Center Fact Sheet: PFOS/PFOA, dated Nov. 7, 2016 (AF04-00768856)
120	EPA, Provisional Health Advisories for Perfluorooctanoic Acid (PFOA) and Pefluorooctane Sulfonate (PFOS), dated Jan. 8, 2009.

EXHIBIT	DESCRIPTION
121	Exhibit DL74B to the Deposition of John Butenhoff, excerpt from ATSDR Toxicological Profile for Perfluoroalkyls, dated June 2018
122	Exhibit DL455 to the Deposition of Anne Regina, EPA Technical Fact Sheet – PFOS and PFOA, dated Nov. 2017
123	DoD Manual 4715.20, Enc. 2 (1)(a), Enc. 3 (1)(a), (b). DOD Manual § 4715.20.
124	Exhibit DL1380 to the Deposition of Frederick Walker, Email chain, dated Nov. 3, 2016, re: Air Force official defends foam use despite PFCs (Navy02-00009228)
125	2021 Inspector General Report titled “Evaluation of the Department of Defense’s Actions to Control Contaminant Effects from Perfluoroalkyl and Polyfluoroalkyl Substances at Department of Defense Installations”
126	Exhibit DL1353 to the 30(b)(6) Deposition of John Gerber, FC-95, FC-143, and FM-3422 – 90 Day Subacute Toxicity Studies Conducted at IRDC – Review of Final Reports and Summary (3M_AFFF_MDL02174949)
127	Exhibit List to Plaintiffs’ Opposition to Defendants’ Motion for Partial Summary Judgment on the First Element of the Government Contractor Immunity Defense